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# Worldwide Report

## NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 97

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# WORLDWIDE REPORT

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## BRIEFS

PORTUGAL SELLS URANIUM TO IRAQ--Tel Aviv, 7 April--Portugal has sold 120 tons of non-enriched uranium to Iraq, the newspaper HAARETZ said today, quoting "well-informed sources." The uranium reportedly has already been shipped. In a dispatch from London, HAARETZ quoted British sources as saying that Baghdad made the uranium shipments a condition for continued Iraqi oil deliveries to Portugal. Portugal has maintained that the uranium transaction was perfectly legal, as both countries have signed the Nuclear Non-Proliferation Treaty, the newspaper said. But HAARETZ quoted a high Portuguese official as saying: "If Baghdad decides one day to violate this treaty, it is no longer our business." NAB/AFP [Text] [Rangoon THE WORKING PEOPLE'S DAILY in English 9 Apr 81 p 3]

CSO: 5100

# NUCLEAR POWER PLANT IN NT CONSIDERED, REJECTED

## State Government Plans

Sydney THE SYDNEY MORNING HERALD in English 18 Apr 81 p 2

[Article by Tom Ballantyne]

[Text] The Northern Territory Government plans to press ahead with the construction of a $1,000 million nuclear power station near Darwin.

And the Territory hopes the Federal Government will foot a major part of the bill over the 10-year period it will take to build.

Staff at the Territory's Department of Mines and Energy and Electricity Commission are already working on an option paper to give the Government a choice between a United States light-waer [as published] and a Canadian heavy-water system according to a senior Government source.

(Light-water is ordinary water containing hydrogen, while heavy-water has a density 10 per cent greater thaan [as published] the ordinary type created by also containing an isotope of hydrogen, deuterium.)

High-temperature, gas-cooled systems and fast-breeder reactors have been ruled out as having been insufficiently developed for use in the Northern Territory.

The option paper will go before Cabinet in Darwin within the next few months.

Most members of Cabinet are known to fully support the building of a nuclear power plant and construction is expected to get a prompt go-ahead.

The power station would be built within 50 to 80 kilometres of Darwin.

Light-water reactors, or pressurised water reactors, were the first to be built in the US. They have become the world's most popular type of power station with about 130 in operation or under construction in 17 countries.

They are called light-water to distinguish them from the heavy-water reactors.

Light-water reactors have their fuel elements immersed in ordinary water under sufficient pressure to keep it from boiling. The fuel rods contain pelllets of uranium dioxide. [as published]

The Canadian heavy-water reactors use pressurised heavy water as coolant and their fuel rods are natural uranium oxide pellets contained in zircaloy tubes.

A claim made for the Canadian system is that it carries less risk of nuclear proliferation.

A nuclear power station will be a substitute for Darwin's expensive oil-fired generators.

A 1,000-megawatt light-water reactor would cost about $1,000 million and take 10 years to build.

The Minister for Mines and Energy, Mr Tuxworth, has said the Government is studying a propoal [as published] to build a uranium enrichment plant in the Territory.

It would convert yellowcake to uranium hexafluoride--a reactor-grade fuel source. Negotiations between the Territory Government and the Federal Government are underway.

The major problem facing the Territory in building a nuclear power station will be raising the finance.

## Negative Study Findings

Canberra THE AUSTRALIAN in English 21 Apr 81 p 1

[Article by Errol Simper]

[Text]

**A $1000 million scheme to build Australia's first nuclear power plant in Darwin has been rejected on economic and constitutional grounds in an official study.**

Instead, the internal Northern Territory Government study has opted for a plan to build a coal-fired electricity generating plant.

Last November *The Australian* revealed exclusively that the Territory was examining nuclear power as a long-term solution to a crisis in which the cost of Darwin's heavily subsidised power supply rose by 16 per cent in 13 months.

The territory's Chief Minister, Mr Everingham, said at the time there was a danger the Commonwealth would refuse to give a $48 million subsidy for Darwin's electricity supply and if investigations favored nuclear power he would ask the Government to help pay for a nuclear power plant.

Yesterday the territory's Minister for Mines and Energy, Mr Tuxworth, revealed that a five-month study by energy specialists had rejected the idea.

He said the Northern Territory Government had already put an alternative scheme for a new coal-fired generator to the Federal Government.

But last night a former chairman of the Australian Atomic Energy Commission, Sir Philip Baxter, criticised the report's findings.

He called on the commission to carry out more comprehensive studies on the project.

In Darwin, Mr Tuxworth said an important factor in rejecting the nuclear plant was the cost.

"In economic terms you've got to go for about a 1000 megawatt station and we just don't have the load-base in the Northern Territory which would use 1000 megawatts," he said.

"Another factor was that we have to do something by 1985-86 in terms of doubling our present power-generating capacity and we couldn't possibly build a nuclear station inside 10 to 12 years."

Mr Tuxworth said the report had also highlighted constitutional and legislative problems which advisers had told him could take at least five years to sort out.

"There is no provision in law at present for any State to build a nuclear power station," he said. "In fact, nuclear material is controlled by the Federal Government under the Atomic Energy Act, which was ostensibly a defence piece of legislation.

"We don't have a framework at present which defines State and federal nuclear responsibilities and we don't have any framework which would enable either party to go ahead and build a nuclear station," he said.

"Even if we wanted to start building tomorrow we have that considerable problem confronting us."

(A confidential report leaked by the Federal Opposition last month shows that the Government plans to introduce legislation to establish a full nuclear industry, including power stations and enrichment plants).

In Sydney, Sir Philip Baxter, who was closely involved in abortive plans in the late 1960s and early 1970s for a Commonwealth-backed nuclear plant at Jervis Bay on the NSW south coast, said smaller stations could be economic, and studies on the issue should continue.

"I still think we'll be building nuclear power stations around the coast in most of the main industrial States before the turn of the century," Sir Philip said.

"Parallel with that there'll have to be a nuclear industry, refining fuel, enriching it, reprocessing spent fuel and disposing of waste."

Sir Philip said the Jervis Bay station was to have been of only 500 megawatts yet the Indian Government had just revealed plans to build five new nuclear stations in the 375-400 megawatt range.

Sir Philip said the Atomic Energy Commission should do a comprehensive study of the nuclear plant project.

"The obvious people (to carry out the study) are with the commission. They could do it very thoroughly because they've got half a dozen or more very experienced people in this field who, at the moment, have very little to do," he said.

"I would say, 'Go on with the study and get some better informed people'.

"We don't have to rely entirely on Australians. We've got some very good people in the commission, but the Canadians and quite possibly the French or the Germans would be happy to help.

"I think the immediate economics in the territory would turn on being able to find a user for a large, steady load.

"I would have thought that was something which would appeal to the aluminium industry."

Mr Tuxworth said the territory had "fallen back" on the option of a coal-fired station because of the report's findings.

"It's not a matter of choice. If we had rivers to dam, gas wells we could tap into and coalfields we could look at here, we would have had a much easier run," Mr Tuxworth said.

"But we don't have those options. Our only possibility now is to import coal from Queensland and build a coal-fired station.

"We've put a proposal to the Commonwealth explaining what we want to do and why we want to do it, and we're waiting for a response. It's a process of elimination."

In July 1969, the then Prime Minister, Mr Gorton (now Sir John Gorton), announced a federal-NSW feasibility study into a nuclear reactor for Jervis Bay.

The project was continually deferred and in October 1975 a House of Representatives standing committee on environment and conservation recommended that the Government drop the idea.

### Editorial Comment

Canberra THE AUSTRALIAN in English 21 Apr 81 p 6

[Excerpt] There is much to ponder in today's story that the Northern Territory Government has ruled out the possibility of nuclear power generation to meet the Territory's increasing and increasingly-costly demand for power. But no aspect is more depressing than the statement that, ignoring all other considerations, the proposition is not feasible because to sort out the constitutional and legal ramifications involved would take at least five-years--before construction could even begin.

Questions must be asked of the Government--and particularly of the Deputy Prime Minister and Minister for Trade and Resources, Mr Anthony, and the Minister for National Development and Energy, Senator Carrick: What have you and your departments been doing? For years you have been plugging Australia as a world supplier of uranium for power generation--yet you have not cleared the way for that process to be used in Australia. Surely, this represents neglect and inefficiency on a major scale? Or is the lack of action evidence of politicking taking precedence over the nation's needs--an unwillingness to act in a politically sensitive area?

If any part of Australia presents itself as an obvious contender for nuclear power generation it is the Northern Territory. It has immense natural resources and enormous potential. But those resources cannot be properly developed or the potential realised without adequate power. And the resources of the area do not include coal, the source of most of Australia's power. It does, however, have uranium--in large quantities. Yet we now have the situation where the Territory's Minister for Mines and Energy, Mr Tuxworth, says he is forced to recommend the building of a major power station to be fuelled with coal which will have to be brought all the way from Queensland. It is difficult to decide whether the situation should be described as Gilbertian or straight from Alice in Wonderland.

CSO: 5100/7536

## CONTROVERSY RAGES OVER RADIATION DANGER AT URANIUM MINE

Melbourne THE AGE in English 21 Apr 81 pp 1, 3

[Article by Denis Reinhardt and Peter Roberts]

[Text] Underground miners working a French-owned uranium deposit in North Queensland may have been exposed on occasions to levels of radio-active radon gas as much as 160 times the recommended level, according to documents lodged in a Queensland court.

According to documents, produced in the Charters Towers Mining Warden's Court, high levels of exposure may have occurred at intervals over a period of about eight months from mid-1979 at the Ben Lomond mine.

The mine, about 50 kilometres south-west of Townsville, is operated by Minatome Australia Pty. Limited. The managing director of Minatome, Mr Bernard Cahen, denied that permissible radiation levels had been exceeded at Ben Lomond.

A company safety officer, who wrote the reports produced in court last month, quit the company after accusing Minatome of having ignored his warnings.

Local conservationists, who have vigorously opposed the venture, subpoenaed the weekly radiation safety reports from Minatome.

The company files, admitted as evidence by the Charters Towers mining warden, Mr Eric Lendich, include allegations of defective underground ventilation, inadequate equipment leading to radon gas "hot spots" and recirculation of radioactive air.

At least six times between June 1979 and January last year, the mine safety officer, Mr Graeme Legge, whose job it was to monitor levels in all parts of the mine, lodged critical reports. Mr Legge is believed to have left Minatome in January last year after noting that "since most of my recommendations have been ignored, we will now suffer the consequences of our ignorance and arrogance".

Mr Legge objected to what he said were descriptions by mine management of his radiation readings as "of scientific interest only".

Radiation exposure in mines is measured on an accumulating basis in units called "working levels per month". Under the Federal Government's code of practice for uranium mining, a worker may be exposed to a maximum of four working levels per month (WLM) over a full year, and not more than two WLMs in any three-month period.

On Sunday 11 October, 1979, Mr Legge recorded a radon level in the main exploratory shaft of 18 WLMs. On 10 December 1979, a reading of 57 was recorded in a side-shaft in the mine. Both these figures are considered to be very high for any uranium mine.

Mr Legge expressed concern about procedures intended to minimise radiation exposure in the adjacent mine camp, housing about 50 men.

He wrote on 22 November 1979: "The mines regulations lay down clear instructions regarding facilities required in such an area, the area is a complete and utter mess...since we agreed with the Mines Department that we would follow both mines regulations and the code of practice (for uranium mines)--we should follow them."

"When the company abides by the rules, the often-expressed concern regarding the company's neglectful attitude towards it workers will cease. Until that time, the company's reputation will continue to deteriorate."

On 12 December 1979, Mr Legge urged the mine manager, Mr John Weil, to stop all mining work. (Large volume samples were being extracted from the mountain).

"The latest results show that the present ventilation system is now unsatisfactory with respect to airframe radiation control. I must strongly recommend that no further mining work be carried out until a ventilation system which is capable of delivering much larger volumes of unused air to the workfaces is installed."

Mr Legge accused Minatome, which has other uranium prospects in Northern Australia, of not understanding theories of ventilation in underground uranium mines. "When such is combined with inexperience and lack of understanding of radiation safety fundamentals, then undesirable situations are created. The measurement and keeping of records is only part of the job. My work is...essential to the understanding of the situation and hence to the prediction of future situations."

The following week, Mr Legge reported that he had had to use tape to repair a hole through which 30 to 40 per cent of the fresh air to the mine face was escaping.

At this time, a State mines inspector arrived and ordered that, before work restarted after the Christmas 1979 vacation, the ventilation system "must be redesigned to the inspector's satisfaction".

Mr Cahen denied that permissible radition levels had been exceeded at Ben Lomond Speaking from the company's Townsville branch office, Mr Cahen admitted that there had been high radon gas readings. "However, I stress that on only two occasions have they reached 50 per cent of maximum admissible levels," he said.

Asked to comment on figures in extracts from the company's records, he said: "You can quote me, I'll be suing any newspaper that prints that."

Mr Cahen said that he had consulted the company's lawyers over whether the public had a right to access to the court documents. (Minatome engaged a Brisbane Queen's Counsel to defend itself against objectors appearing in Charters Towers Mining Wardens Court).

"I got the impression the documents were for the public to look at only, so I can't understand how you have them," he said. "The copies you have must be misleading."

Minatome already has permission from the Queensland Government to mine and has applied for an additional lease to build waste ore dumps and settling ponds.

Environmentalists claim that toxic wastes threaten Charters Towers water supply and the purity of the Burdekin River in its lower reaches.

The French Government has an indirect interest in Minatome Australia Pty. Limited through two of France's largest energy corporations.

Total Oil (Compagnie Francaise des Petroles) and Pechiney Ugine Kuhlmann are the principal shareholders of Minatome SA which, in turn, wholly owns Minatome Australia Pty Ltd.

The expected 4000 tonnes production of uranium oxide may go to France's atomic powerhouses.

CSO: 5100/7536

## UNIONS, OTHERS STEP UP ACTION AGAINST URANIUM MINING

### Darwin Picket Lines

Melbourne THE AGE in English 21 Apr 81 p 4

[Text] About 100 striking employees of the North Territory's two uranium miners have extended their pickets into Arnhem Land.

They want to stop truck drivers, members of the Transport Workers' Union, from delivering to the mine and mill owned by Queensland Mines at Nabarlek and Ranger Uranium project in Jabiru. The men want a wage rise of about $6 a week and a variety of benefits. They have been on strike for about a month and began picketing the offices of the two companies in Darwin last week after establishing outposts on the Arnhem Highway, which leads to both sites.

Now they have set up a picket at the crossing of the East Alligator River, last stop before reaching the mines.

Last month Ranger Uranium agreed to high termination payments for about 800 workers employed by sub-contractors on its project at Jabiru. The last of these men is expected to leave about August. But talks between the companies and Miscellaneous Workers' Union about increased benefits for men employed by the companies themselves failed and the strike began.

The pickets are beginning to win support from the truck drivers, some of whom are refusing to make deliveries.

Queensland Mines can hardly afford to offend the TWU members. Members of that union will almost certainly be needed to load and refuel aircraft to carry yellowcake the company has stockpiled at Nabarlek to its customers in Japan.

Aircraft have to be used because seamen in Darwin have decided not to crew barges carrying yellowcake between here and Singapore.

The owner of the barge, the Darwin-based shipper [illegible]. B. Perkins and Co. Limited, originally dismissed the 18 seamen, but the dismissals were withdrawn after officials of the Seamen's Union warned of retaliation.

Previously, the yellowcake was flown to Darwin in 2100 kilo loads. It was then loaded aboard the barge by TWU members. Both the MWU and the TWU have defied the ACTU's directive not to work uranium.

# Ben Lomond Ban

Sydney THE SYDNEY MORNING HERALD in English 21 Apr 81 p 11

[Article by Andrew Stone]

[Text] Brisbane.--Another trade-union has opposed a controversial French uranium mining project near Townsville.

The Municipal Officers' Association, whose members supervise power installations, has banned all work on the Ben Lomond mine.

The decision, made at the association's biennial federal council in Brisbane, has set the stage for a bitter conflict between the unions and the Queensland Government.

It means that electricity supply to the mine, 50km west of Townsville, is in doubt.

Other key unions that have opposed the uranium mine are the Australian Railways Union, the Electrical Trades Union, and the Australian Telecommunications Employees' Association which has banned telephone links to Ben Lomond.

The Queensland Opposition Leader, Mr Casey, has promised that a future Labor Government would cancel any Ben Lomond uranium deal.

The State secretary of the Municipal Officers' Association, Mr Ray Selby, said yesterday that the union supported the ACTU policy on uranium.

"We want the stuff to say in the ground until we get proper assurances on safeguards," Mr Selby said.

"No one is denying that uranium can be a useful power source, but our members' safety is the more proximate concern.

"The association has made a determined stand because uranium is such a big unknown."

Ben Lomond is being developed by Minetome Australia Pty Ltd, a joint venture involving the French mining and oil giants Pechiney and Total.

One reason for the mounting opposition to the project lies in its French connections.

Union officials and anti-nuclear groups have pointed to French nuclear tests in the Pacific as grounds for opposing the mine.

They say France has always refused to sign the nuclear non-proliferation treaty and remains a leader in nuclear weapons technology.

Mining is scheduled to begin at Ben Lomond in 1984. The company has developed the site for underground mining and applied for a second mining lease.

Minatome is still awaiting export approval from the Federal Government.

## Victoria Movement

Melbourne THE AGE in English 23 Apr 81 p 17

[Article by Peter Roberts, Science Reporter]

[Text] Opponents of uranium mining in Australia plan to start a year-long campaign against what they call the pro-nuclear policies of the Victorian Government.

The Movement Against Uranium Mining will co-ordinate the campaign of community and environment groups to be launched in June--a year before the next State election is due.

The convener of the movement, Dr Joe Camilleri, said yesterday that the campaign would run in 12 marginal electorates using tactics based on experience gained in a two-electorate campaign at the last Federal election.

"The campaign will be openly and bluntly for the defeat of the Hamer Government," Dr Camilleri said. "We won't suggest how people should vote, but we will say no to the Government's pro-nuclear policies."

The ALP, the Australian Democrats, the Australia Party and the Communist Party all have anti-nuclear policies in Victoria.

Dr Camilleri, a lecturer in politics at La Trobe University and a member of the ALP, said the Liberal Party was leading Victoria along a nuclear path. This was despite the majority opposition to uranium mining and nuclear power shown in recent public opinion polls.

CSO: 5100/7537

## BRIEFS

SINGAPORE WASTE ACCORD--Western Mining Corporation has agreed to store 100 drums of radioactive waste now in Singapore. WMC's director of operations, Mr K. Parry, said yesterday that the waste would probably be stored at Kambalda because it might have come from there. Simmetal and Singapore National Iron and Steel were negotiating for transporting the material to WA. Mr Parry said he expected developments in the next couple of weeks. The material would be stored in secure premises in a locked compound. The Acting Premier, Mr O'Connor, said yesterday that the Commonwealth and State Governments had agreed that the waste should be stored in WA. "It is now up to the companies involved to make appropriate arrangements for its transport and storage in a manner acceptable to both governments," he said. There was no health risk from the material, which had a very low level of radioactivity, he said. But the Governments' decision did not set a precedent. [The WA Trades and Labour Council on Tuesday night accepted advice that the 100 drums could be safely received in WA. It had considered a ban on its importation.] [Excerpt] [Perth THE WEST AUSTRALIAN in English 23 Apr 81 p 21]

CSO: 5100/7537

INDIA

# NUCLEAR FUEL COMPLEX CONTAMINATION OF WATER DENIED

Madras THE HINDU in English 14 Apr 81 p 11

[Text] HYDERABAD April 12

The Department of Atomic Energy's Nuclear Fuel Complex on the outskirts of Hyderabad has lately come in for criticism.

The NFC was involved in a controversy last year over contamination of drinking water wells in neighbouring villages.

Only a few weeks ago, a woman and three children were killed and more injured in a fire mishap in the NFC's sprawling complex, while a highly "pyrophoric" waste material was being unloaded from a lorry for disposal. The fatal accident figured in Parliament also.

A spokesman of the NFC told THE HINDU that there was no possibility of contamination of drinking water sources because all the effluents or waste material were disposed of within the premises. An expert from the Bhabha Atomic Research Centre, Bombay, who had examined the waste disposal or effluent treatment process at the NFC was satisfied, he said.

Scientists at the NFC deal with two categories of materials-radioactive and non-radioactive. The radio-active wastes are of two types — compressionable and non-compressionable solid wastes.

The solid wastes which cannot be compressed are kept in polythene bags made of special material, sealed and buried underground at a fenced off and guarded place within the premises. The Health Physics Division at the NFC makes periodic checks to see that the radiation level does not exceed the prescribed limit.

In the process of manufacture of uranium oxide, cotton gloves and even uniforms of technicians get contaminated through contact with a radioactive substance like uranium. These "compressionable solid wastes", are kept in special containers and buried. The duty uniforms of technicians and others are washed in the NFC itself.

Among the non-radio active solid wastes is zirconium, a highly pyrophoric substance capable of catching fire on exposure to air and emitting tremendous heat while burning. Uranium is sheathed in zirconium tubes.

The zirconium powder or filings are considered very dangerous and hence always kept under water. The bins containing zirconium powder or filings are unloaded on a elevated platform within the NFC premises. After water is drained off, the solid waste is set on fire through a ball of cotton thrown from a safe distance.

A fireman and some people from the NFC must be present when zirconium is disposed of.

It was while disposing of zirconium waste that the mishap occurred late last month. Besides the woman and the three children who were killed, several others, mostly children, sustained burn injuries. The lorry in which the material was brought was damaged.

NFC authorities explained that although the area was prohibited to the public, the restriction could not be enforced because it also housed the staff quarters.

While the zirconium waste was being unloaded some outsiders, mostly women and kids, rushed to the place and there was a scramble among them to pick up scrap items like nuts and bolts from the material. The material caught fire suddenly and spread to the lorry nearby.

Chemical wastes like acids are neutralised and allowed to settle in evaporation tanks and the solid waste, like certain nitrates, is sold after evaporation.

CSO: 5100

## BRIEFS

NUCLEAR POWER PROGRAM--New Delhi, April 1--Subject to availability of financial resources and basic inputs, India hopes to achieve a nuclear power generation capacity of 10,000 mw by 2,000 AD. The Prime Minister, Mrs Indiar Gandhi, told Mr Balasaheb Vikhe patil, in a written reply in the Lok sabha today that the programme would consist of a number of different projects. [as published] The cost of each would be worked out at the appropriate time. The cost escalation of the three nuclear power projects--RAPP, MAPP and NAPP--would not delay the completion of the projects. Their revised estimates had been approved and funds provided, she said. The cost escalation in respect of each of these projects is: RAPP--Rs. 80.51 crores, MAPP--Rs. 78.48 crores and NAPP--Rs. 166.11 crores, of which the increase in the prices of equipment--both imported and indigenous--accounted for Rs. 49.61 crores, Rs. 64.30 crores and Rs. 119.83 crores respectively. The Government proposed to start work on setting up a new atomic power station in the western region during 1981-82.--PTI [Text] [Madras THE HINDU in English 2 Apr 81 p 7]

URANIUM DEPOSITS DISCOVERY--New Delhi, 15 April--The Indian Government today told Parliament that more uranium deposits had been found in parts of the country, but gave no estimate of their size. Minister of Science and Technology CPN Singh told Parliament the deposits had been found in the northern states of Himachal Pradesh, Uttar Pradesh and Madhya Pradesh and the southern state of Karnataka. At present uranium deposits mined in the northern Bihar State totalled 67,000 tonnes, Singh said. He said three new uranium mines and two more uranium mills were being opened in Bihar. The increased capacities of the mines and mills would help India produce a targeted 10,000 megawatts (MWs) of atomic power in the current Sixth Plan period (1980-85), he said. The country's two nuclear power stations in operation in Tarapur near Bombay and Kota in western Rajasthan State have a generating capacity of 890 MWs. Two more nuclear power stations are under construction. NAB/REUTER [Text] [Rangoon THE WORKING PEOPLE'S DAILY in English 17 Apr 81 p 5]

EXPLORATION FOR DEVELOPING COUNTRIES--New Delhi, 6 May (AFP)--India has reached a stage where it can offer assistance to other developing countries in uranium exploration, Chairman of the Atomic Energy Commission H. Sethna has said. Reports quoted him as saying to reporters at Kurukshetra, in the northern Haryana State, that this country was also now in a position to take up turn-key aerial and land-based uranium exploration assignments abroad. He disclosed that India had an estimated 53,000 tonnes of uranium reserves detected in the course of surveys conducted in various parts of the country. Of this, 30,000 tonnes were "reasonably assured." He also stated that a new 100-tonne nuclear fuel reprocessing plant was proposed to be set up at the Kalpakkam atomic power station in the Tamilandu (formerly Madras) State. This would be an improvement over the present one at the American-built Tarapur atomic power plant near Bombay. [Text] [BK070619 Hong Kong AFP in English 1633 GMT 6 May 81]

CSO: 5100/2247

## REPORT ON NUCLEAR POWER PLANT DEVELOPMENT, PLANNING

Jakarta KOMPAS in Indonesian 13 Mar 81 p 5

[Article by Ir Basri Mangun: "Nuclear Energy"]

[Text] The National Atomic Energy Board was able to hold several "NUSS meetings" [expansion unknown] in Jakarta and Bandung 2-6 February without much fanfare. About 30 Indonesian nuclear experts attended the meetings.

Three staff members of IAEA [International Atomic Energy Agency], located in Vienna, Austria, gave a series of lectures at the seminars, including "Governmental Organization for the Regulation of Nuclear Power Plants" by H. Andreas, "Safety in NuclearPower Siting" by E. Iansiti and "Quality Assurance for Safety in Nuclear Power Plants" by N. Raisic.

Slides were shown to provide a better idea of actual site conditions. The series of lectures constituted one part of the "NUSS Program," which has been established in order to furnish instruction and guidance to member states (including Indonesia) in matters of health and safety at reactor sites. Consideration is given not only to power plant organization, design and location, but also to quality assurance.

From the 1960's a number of industrialnations began to break away from dependence on oil-based power sources for generating electricity to nuclear power. IAEA began to study marketing prospects for establishing nuclear power plants in the industrial nations. After the oil crisis occurred at the end of 1973, attention to nuclear energy intensified.

### Developments in Indonesia

Indications of Indonesia's interest in nuclear power became apparent in 1970 with the holding of nuclear energy seminars. Subsequently the Preparatory Commission for the Development of Nuclear Power Plants was created.

The Preparatory Commission was officially established under a joint directive of the minister of Public Works and Electric Power and the director general of BATAN [National Atomic Energy Board]. All members of the commission were appointed through the executive order of the minister of Public Works and Electric Power in July, 1972.

In order to finance the work of the commission, the Indonesian and Italian governments signed a bilateral agreement at the end of 1977 whereby a joint venture was established between BATAN and NIRA [Italian Nuclear Company for Advanced Reactors]. In turn NIRA involved ENEL [National Electric Power Company of Italy], whereas BATAN invited the participation of PLN [Indonesian State Electric Company].

As a result of these new affiliations, feasibility studies on building the first nuclear power plant in Indonesia were conducted. BATAN submitted the results of the studies in February, 1981.

In the meantime the Preparatory Commission continued to observe a rigorous work schedule. The progress of the commission's efforts can be followed through its annual reports.

As a result of the feasitility studies and the seminars, a number of factors involved in nuclear power plant development have been clarified. They are:

1. Concerning alternative energy sources--It is clear that dependence on only one kind of energy source, oil in particular, is no longer desirable.

2. Economic considerations--

a) A number of studies have concluded that the cost for operating nuclear power plants is less than for power plants fueled with coal or oil.

b) Appropriate timing for the construction of nuclear power faciliteis will mean taking into consideration operating expenses, rate levels and the growth rate of electric power consumption.

c) Because of the large amount of capital needed to build the plants, consideration should be given to obtaining funds with the lowest possible interest rates and measure of liability.

3. Technological considerations--

a) From the start plants are to be held accountable for guaranteeing environmental protection and human safety.

b) Plants need to keep up with the latest technological advances at all times, particularly in relation to emergency safety procedures and the possibility of a reactor core meltdown.

c) The kinds of nuclear power plants that are built will depend on long-term national developments in such areas as manpower potential and skill levels and the continuing availability of raw materials.

The development of Indonesian nuclear power stations will largely be a result of the already constant labors of BATAN and PLN, the authoritative organizations.

The kinds of differences that exist between these two organizations will provide them with a much broader perspective as they interpret the results of the studies.

The government also engaged INKINDO [National Association of Indonesian Consultants] a private institution, in addition to several other government organizations, at each stage of planning for the building of the power plants.

Up till now INKINDO has always been inculded in the seminars, studies, surveys and research. Later, higher educational institutions will also probably need to become involved. At the very least the scientific information they obtain will enable them to become agencies for disseminating information about nuclear power to the general public.

Pilot projects at universities in Jakarta, Bandung and Yogya might be established as a first step in order to promote research and training in nuclear technology. Quite a few nuclear experts affiliated with BATAN are located in those cities.

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CSO: 5100/8112

## BAIQUNI DENIES REPORTS OF LEAK IN RESEARCH REACTOR

Jakarta KOMPAS in Indonesian 5 Mar 81 pp 1, 9

[Text] Prof Dr Baiquni, director general fo BATAN [National Atomic Energy Board], has denied reports that have been circulating of a recent leak in the Kartini nuclear reactor in the village of Babarsari east of Yogyakarta. "The Kartini reactor has never been defective," Baiquni stated. "No reactor component has ever leaked or needed to be replaced. Neither the general public living in the vicinity of the reactor nor any of the workers at the site has ever been endangered." THe director general said that rather than being defective, the reactor was operating normally and that just last week the uranium fuel elements were replaced after approximately 2 years of use.
Rumors about a Kartini reactor leak began to spread in the local community at the beginning of last month. The source of the reports remains unclear.

The Babarsari reactor functions chiefly as an instrument for nuclear physics research and development and for training and educational purposes. Furthermore, according to plans, the reactor eventually will produce heavy water and purify nuclear fuel. The reactor complex, which has now been given the new name "PPBMI-BATAN" Yogyakarta [Center for the Study of Pure Materials and Instrumentation], was officially opened by the president on 1 March 1979.

The reactor system is located in a control building covering a 900 square meter area. There is a 32.5 meter cooling tower at the site with an effective area of 360 square meters. The depth of the reactor vessel is 6.5 meters and its diameter is 2 meters. There are 71 fuel elements in the core, capable of producing 250 kilowatts. But up till now the reactor has only been operating at a capacity of 50 kilowatts.

The fuel used for operating the Kartini reactor is uranium zirconium hydride (UZrH) enriched with 20 percent U-235. This kind of fuel is only produced in the United States by the General Atomic Company.

Prof Baiquni explained that Indonesian technicians planned and constructed the Kartini reactor entirely by themselves. They were able to make use of materials from the Serpong nuclear project during construction. The Serpong project was never finished, even though Indonesia fulfilled its financial obligation completely. TheRussian engineers simply abandoned the project.

"From the very first moment we expressed a desire to build our own reactor," Baiquni said, "there have been those of us who doubted the possibility. But even though now we have realized our goal, some individuals simply continue to spread these absurd rumors. Perhaps they really want us to import goods from abroad indefinitely. But who cannot be proud of the young Indonesians who have successfully built a reactor that they themselves planned and are capable of operating? Let us, then, have no more of these false accusations!"

The director general gave assurances that even though the water in the reactor does indeed contain radioactive isotopes, no radioactive waste has been released. All of the water is immediately repurified and used continuously. "Where, then, is the leak they're talking about?" Baiquni asied. "The only thing that really leaks is the roof of the control building, and then only when it rains hard. The reactor is not disturbed because the leak is outside of the reactor chamber." Baiquni thinks that the rumors concerning hazardous radioactive elements, if not circulated by those who are loath to witness the accomplishments of Indonesian nuclear scientists, may really be spread by unscrupulous land agents who wish to control the real estate surrounding Babarsari. "It is noteworthy," Baiquni said, "that in this particular area, apart from the nuclear reactor complex, there area college campus, a housing complex and several guest houses."

## The Heart of the Reactor

In order to substantiate his earlier comments, Director Jeneral Baiquni invited KOMPAS reporters on Tuesday afternoon to observe the "heart" of the Kartini reactor at first hand. Haryono, the director of PPBMI-BATAN, accompanied the group.

We were in a special room equipped with a device for detecting any dangerous level of gamma rays or streams of neutron particles. It was quite apparent that safety precautions at the site are multifaceted. Except for the cooling water, which is constantly monitored for radiation levels, the surrounding air and all equipment undergo a cross-checking safety procedure. This system is not only able to broadcast the sound of a very loud alarm if signs of danger are detected, but is also equipped with a large red light which can be seen shining from all angles. In addition, two reactor operators and a nuclear engineer are always on hand, having responsibility for control room safety procedures. If there is a breakdown, then, a number of backup systems are ready to take over. Even if an outsider were able to enter the facility and make an attempt to operate the equipment, he would not succeed. Only the control room supervisor knows how to disengage the security system.

Parts of the reactor chamber are radioactive when the plant is in operation. These areas are off limits, of course, and are marked accordingly.

Director Haryono approahced one of those places, a yellow iron pipe in which reactor cooling water flowed. He pointed a neutron monitoring device toward the pipe to measure the amount of radiation. The needle indicated a radiation level of about 1.5 millirems. "That means you would be exposed to 1.5 millirems of radiation each hour you continuously held the pipe," Prof Baiquni said. He was quick to follow with the question, "What dose do you receive when you have a normal X-ray? No less than 20 to 30 millirems for each photo." This is reason, Haryono said, that the workers in the Kartini reactor are safer than technicians who operate X-ray machines every day. The exposure level is less than one-twentieth.

Concerning the matter of the leaky roof, Prof Baiquni pointed to the obviously less than perfect connection between two sections of the building. "Now certainly a leak like this is the responsibility of the building contractor and not the nuclear scientists," he said with a grin. The fact is the leak and the rain water are outside of the reactor chamber, and there has been absolutely no leak of cooling water, either from the primary coolant system (which connects directly to the reactor) or from the secondary system.

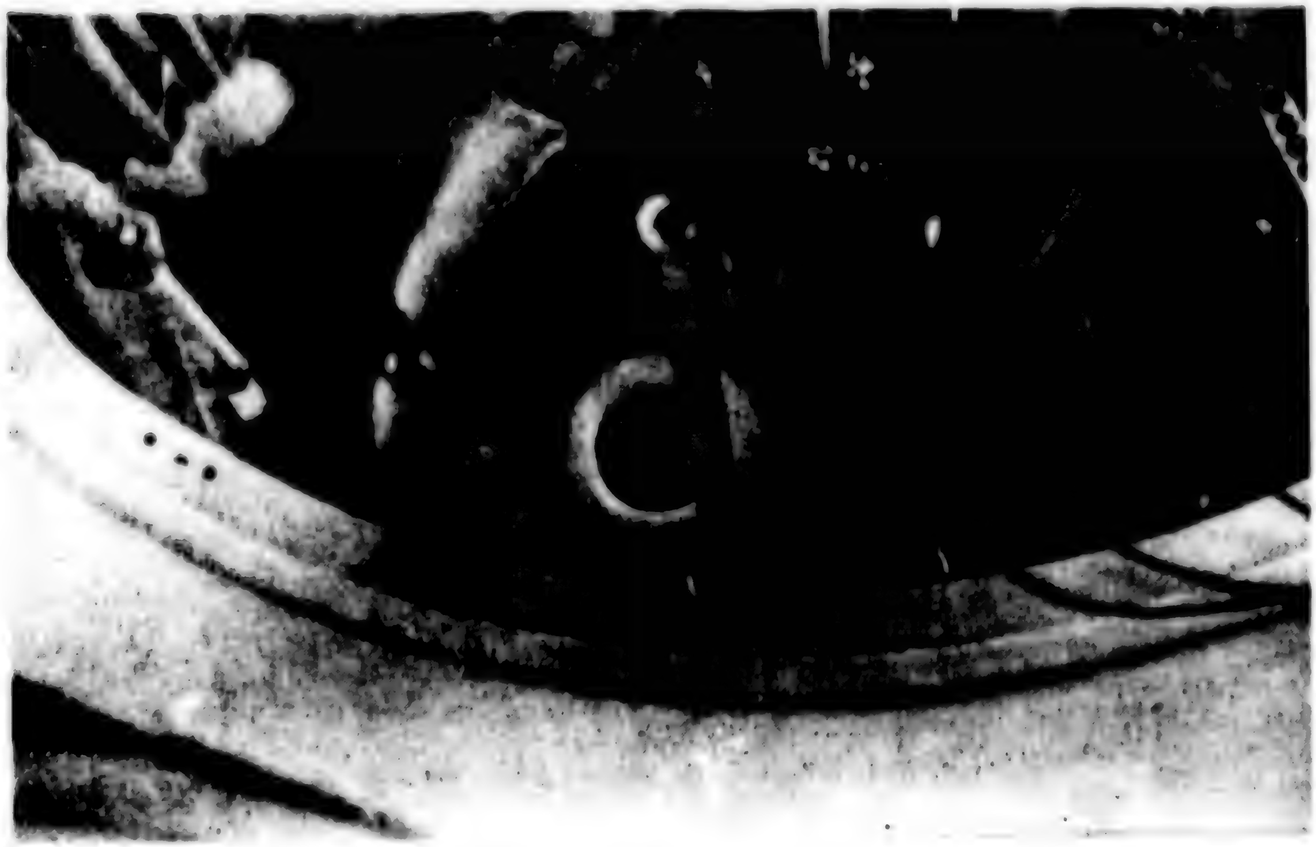

PHOTO CAPTION:

The "Heart" of Kartini. This is the core of the Kartini nuclear reactor located in the village of Barbarsari east of Yogyakarta. The reactor, which uses uranium fuel, is set in a vessel of cooling water 6.5 meters deep. From above, the core is seen as small holes hidden under water.

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JAPAN

## TSURUGA PLANT ADMITS NUCLEAR-WASTE LEAKS FOR FOUR YEARS

Taipei THE CHINA POST in English 30 Apr 81 p 2

[Text] Tsuruga, Japan, Apr. 29 (UPI)--Scandal-ridden Japan Nuclear Power Co. Wednesday admitted radioactive waste from its Tsuruga power plant had been flowing into the city's bay for four years without notifying residents of the potential dangers.

The admission was the latest disclosure by the company which already has confessed to cover-ups of at least two instances of radiation leakage that affected more than 85 workers.

The series of admissions by the Japan Nuclear Power Co. of radiation leaks and attempts to hush up the accidents was certain to set back the government's drive to increase reliance on atomic power in the face of rising oil costs.

Japan obtains about 11 percent of its total power needs from nuclear plants and aims to increase its reliance on nuclear fuels in the future.

The issue of nuclear power is an extremely sensitive one in Japan, the only nation to suffer an atomic attack when the Americans leveled Hiroshima and Nagasaki in 1945 with atom bombs.

Since the installation of the pipe, water containing small amounts of radioactivity was flushed through the pipe to the manhole and flowed into Tsuruga Bay by way of the town sewer, company officials said.

Power company technician Tetsuro Itakura testified before the Lower House of Parliament Science and Technology Committee hearing Tuesday that the controversial pipe linking the power plant to the sewer system was installed in 1977.

Investigators have detected small amounts of cobalt 60 and manganese 54--considered harmful to human health--from the manhole into which water in the two-foot section of pipe flowed.

The disclosure came one day after company's president, Shunichi Suzuki, apologized in the Diet (parliament) for the nation's worst nuclear accident and coverups.

Suzuki said, "I deeply apologize that these accidents and cover-ups took place at a time when the government puts emphasis on power generation by nuclear energy and undermined the people's trust in nuclear power."

He said "there is no room for excuse" for hiding a series of accidents between January and March in which 29 workers were exposed to radiation by leaked radioactive waste.

The Ministry of International Trade and Industry (MITI) has scheduled a general conference Thursday to review Japan's worst nuclear accident, which has polluted the surrounding seabeds and contaminated at least 85 workers since January.

At the session, MITI officials will study preliminary findings brought back from Tsuruga, a town of 60,000 population, by a 10-member fact-finding mission Tuesday.

The mission's investigation focused on company officials responsible for the repeated coverups and why the two condensed nuclear waste storage tanks with the life expectancy of 30 to 40 years began to leak only after 3 1/2 years in use.

CSO: 5100/4907

## LARGE-SCALE YELLOW CAKE PRODUCTION EXPECTED IN JUNE

Taipei THE CHINA POST in English 29 Apr 81 p 10

[Text] Taiwan is ready for large-scale production of yellow cake in June this year, a substance refined from phosphoric acid from which uranium can be extracted.

The Institute of Nuclear Energy Research (INER) and the China Phosphate Industries Corp. are currently conducting test runs on the newly-established yellow cake plant in Kaohsiung.

The joint venture plant will have a production capacity of 10 metric tons of yellow cake a year. The uranium which can be extracted from this amount is equivalent to a year's fuel supply for a nuclear power generation.

The production cost will reportedly average US$33 per pound, or US$13 less than the international spot market price.

The yellow cake will be shipped to other countries through the Taiwan Power Company for further refining and manufacturing into nuclear fuel rods.

An INER official said that patent rights for the production technique will be sought both at home and abroad. Export of the technology will be considered in the future, he added.

CSO: 5100/4907

## URUGUAY, ARGENTINA SIGN NUCLEAR ENERGY ACCORD

Montevideo EL PAIS in Spanish 15 Mar 81 p 1

[Text] Uruguay and Argentina have signed a nuclear cooperation agreement. In a meeting held in Buenos Aires, the heads of the respective nuclear energy organizations—engineer Pablo Banales for our country and Vice Admiral (Ret) Dr Carlos Castro Madero for Argentina—signed the documents calling for cooperation between both countries in the peaceful use of nuclear energy.

The joint plan of action for the 2-year period 1981-82 is intense. It calls for the cooperation of Argentina in the installation of a new hot cell in Uruguay for the production of radioisotopes, and the training of personnel for this activity.

Argentina will also supply materials and offer consulting services for applications in agriculture, medicine, veterinary medicine, industry and natural resources.

In addition, Argentina will offer our country aid in the field of reactors. With this help, the systems and components of the 10 kw Uruguayan reactor will be perfected; their collaboration will also include defining its equipment and instrumentation, and operators will be trained for the reactor.

To provide this training assistance, Argentina will authorize grants for masters degrees in nuclear physics or engineering. These courses are taught at the famous Balseiro Institute of Bariloche. The postgraduate degrees in nuclear engineering will be organized by the CNEA [Argentine Nuclear Energy Commission] and the University of Buenos Aires.

The signing of the document also reflects cooperation in the fields of radiologic protection, safety, radioactive mineral prospecting, and nuclear legislation.

Second Document

The above-mentioned officials from Uruguay and their fraternal country signed a second document.

Forming part of the framework of the referenced two-nation agreement, this document is the protocol for the joint undertaking of a feasibility study for a nuclear facility in our country. This study will make is possible to identify for the Uruguayan Nuclear Energy Commission a site for a nuclear facility. Included in this facility will be a reactor, a radioisotope production plant, laboratories and related installations, which will have as their general purpose the provision of the basic means to carry out the projected research, development and training programs being considered for our country's nuclear policy.

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CSO: 5100/2213

# NUCLEAR, OTHER ENERGY PROGRAMS DISCUSSED

Bogota EL SIGLO in Spanish 15 Apr 81 pp 3, 8

[Article by Olga Cristina Turriago M.: "In Colombia Work Is Being Done With Nuclear Energy"]

[Text] Radioactivity causes changes in the environment in which it is propagated which, in general, are harmful to living matter, but not to inert matter.

For this reason, certain radioactive elements have uses in the field of medicine, for the diagnosis and treatment of cancers; as well as in industry, for the processing of certain products,the X-raying of metal parts, oil exploration, the search for water resources, the preservation of food and another long list of uses.

Nuclear energy is no longer a science completely unknown in Colombia; on the contrary, its use has been extended to each of the country's productive activities, despite the shortage of equipment and professionals in this field.

Just as certain radioactive elements are useful in the search for ores with these features, they are also of use in other similarly important activities.

The Nuclear Affairs Institute [IAN] is in charge of the research on nuclear energy in highly diversified fields and, at the same time, is carrying out practical program which already are being implemented in Colombia.

The first of these relates to the population's safety against radiation. For this purpose, it provides instruments to all the personnel working with radioactive material.

At present, nearly 700 persons are supplied with dosimeters, small devices which must be carried every day by the employees in direct or indirect contact with radioactivity in the business firms, industries or establishments that use it.

The dosimeter measures the amount of radiation that the user has received, and they are periodically inspected by experts in dosimetry in order to ascertain the level shown by each device. In the event that doses which represent a danger are found, the individual is temporarily withdrawn from service, in order to eliminate the radioactivity that he has acquired.

However, no instances have ever occurred in Colombia which represented any danger. But the program was intensified during the period wherein several explosions of nuclear devices took place.

The IAN also makes available the clothing required for direct work with radioactive ores, as additional protection.

Furthermore, every one of the permits for the handling, importing and operation of this type of material, as well as the physical plant in which the radioactive ore will be located, are approved or denied by the INA, after a prior visit to each one of the business firms or factories submitting the request. No one can engage in any handling of radioactive materials or products without the Institute's approval.

As a supplement to this task, the entity carries out constant environmental radiometric studies on the sites where work is being done with radioactivity.

The IAN is, in addition, responsible for establishing the regulations for the handling of products and the security of the personnel associated with it.

One of them is a ban forbidding those under the age of 18 to handle radioactive particles, even indirectly.

Finally, in this area, besides exercising stringent control over the uses of these materials, it is responsible for collecting and storing all the radioactive waste.

### Hydrology

Perhaps one of the most common uses of radioactivity in the field of hydrology is the injection of ammonium bromide into the country's dams and pipes to determine possible leaks that would jeopardize the stability of the water levels or the pressure thereof.

Through this technique, using the injection of radiotracers, it is possible to measure the volumes of flow of rivers, and to determine the hydrological balance of a basin. The IAN has made many studies on the subject, including those associated with the Tachira and Pamplonita Rivers, aimed at investigating certain hydrological parameters in order to solve the water supply problem in Cucuta. Similar studies are being conducted in other parts of the country, as in the case of the sampling of the Bogota Savannah, using isotopic techniques to find out the origin of the subterranean water and to investigate the interconnections of the area's water sources. In this way, it is contributing to the assessment of the water resources present in the subsoil.

For these programs, it has had the advice of specialists from International agencies, and Colombian professionals from the Institute who are working in the field have been trained in more advanced countries.

### Nondestructive Tests

The range of experimentation with nuclear energy in Colombia has also covered areas in which such modern methods had never before been used. This holds true for the

X-ray and ultrasonic inspections made of equipment which, owing to its type and complexity, can only be inspected through rays.

Plants, engines, reactors and all types of metal structures have been analyzed and tested through radioactivity.

The IAN has a Nondestructive Test Laboratory, for which cobalt 60 and other similar sources were acquired, as well as induced current equipment.

The IAN is also working in conjunction with COLCIENCIAS and the International Atomic Energy Agency on two highly important projects, in search of technical and economic backing in the areas of "uranium metallurgy-outfitting and adjustment of the physical and extractive metallurgy laboratories," and the "uranium extractive metallurgy laboratory."

The Institute has, in addition, collaborated, in the form of courses and experiments, with such entities as the National Navy, the Colombian Quality Control Association (with regard to the quality control of materials), the National University and other institutions which are now beginning to concern themselves with the study of this new opportunity for progress and technology offered by nuclear energy.

In the field of instrumentation, at the request of the ETA company and the Bucaramanga Waterworks, a study was carried out to determine possible radioactive contamination of the water and sediment of the Surata River and its tributaries. Similar projects have been conducted on the rivers demonstrating the most danger of contamination, which of course include the Bogota River.

Generally speaking, in the field of the utilization of nuclear techniques in engineering and industry, the IAN has been engaged in an effort to teach these technologies which, although they are of no use in replacing production methods, are good for checking and supplementing these methods.

## Nuclear Medicine

Working very closely with medical entities which use the techniques in the diagnosis and treatment of diseases, in addition to research thereon, the IAN supplies the necessary radioactive elements, which have now started being prepared in its facilities.

There is a growing demand for these elements, because of activities such as the National Cancer Program.

For this reason, the National Institute of Cancerology has undertaken joint projects with the IAN, especially those associated with the radiopharmacy service. To insure this service throughout the entire country, because nowadays the majority of clinics, hospitals and medical centers, as well as laboratories, use radionuclides and other radioactive elements, demands an increasing importing activity, the implementation of which requires several million pesos per year.

In Colombia, nuclear medicine has been extended to many fields, with a considerable increase in the frequency with which these procedures are being used. For example, on the average, the following tests are conducted each month: brain gammagraph, 220; cisternograph, 1; thyroid scan, 1,700; thyroid gammagraph, 1,200; lung gammagraph, 80; cardiovascular images, 115; liver gammagraph, 680; renograph, 150; kidney GFR, 315; kidney gammagraph, 195; placenta, 30; skeleton, 120.

In addition to the nuclear reactor which produces alpha, beta and gamma rays, the IAN has a cobalt source which produces gamma rays and which, owing to its easier handling, is applied more intensively to medicine.

With the cobalt source, it is possible to sterilize all the surgical and radioactive materials that will be used in laboratories and hospitals for X-rays or cancer treatment, particularly using radiation.

As a supplement to this task, the entity is responsible for training doctors and laboratory personnel in the handling of radioactivity, and it makes the required safety equipment available.

## Agricultural-Livestock Uses

One of the most innovative experiments in the agricultural-livestock field unquestionably consists of the methods for preserving food which have had positive results, although still on a laboratory scale.

The preservation method consists of applying a regular dose of radiation to food which is not to be consumed immediately, in order to kill the organisms that cause spoilage. The radiation does not cause any harm to the properties of the food, and makes it possible to keep the food in good condition far longer.

To date, all the experiments have been successful, and it is anticipated that it will be possible to put this important discovery into practice on an industrial scale within a short period of time.

On the other hand, as part of the Institute's hormone laboratory work, specific research projects are under way, aimed at solving animal reproduction problems.

In order to carry out this program, it has the cooperation of the Peace Corps, the Colombian Agricultural and Animal Sciences Institute and the IAEA. The research is currently being carried out in Tibaitata and on the Germania property in Facatativa.

In the same field of experimentation, it undertook a project involving reproductive management of a dairy farm, with an [illegible] of the progesterone in milk.

At the present time, the IAN is considering the possibility, in conjunction with the ICA [Colombian Agricultural and Animal Sciences Institute], of offering Colombian cattle raisers the "early pregnancy diagnosis" service, for which an analysis of costs and supplies is being made.

## Solar Energy

In 1980, the IAN's Solar Energy Department was created, for the purpose of studying the use of such energy and publicizing the advantages that it offers, as well as its easy management, on the industrial level as well. One of the first measures adopted by the department was the installation of a solar distiller at the Institute which made it possible to analyze the output that one of those small apparatuses could produce on the Bogota Savannah.

The entity, headed by Ernesto Villarreal Silva, also provided a glossy map of Colombian territory to the various government agencies, and educational and scientific establishments, whereby it is possible to ascertain the areas and regions which appear to be most benefited by and which are suited for the development of solar energy alternatives.

It is a noteworthy fact that the IAN has concluded a contract for the production of hot climate fruit orchards on the Bogota savannah, using solar energy previously stored in a hothouse.

Although it is impossible to produce atomic weapons in Colombia and the necessary equipment for generating nuclear electric power is not available, which are reasons that some countries may have to use a nuclear reactor, there is every indication that the nation will continue to progress and develop new technologies in all the areas of industry, medicine and economics.

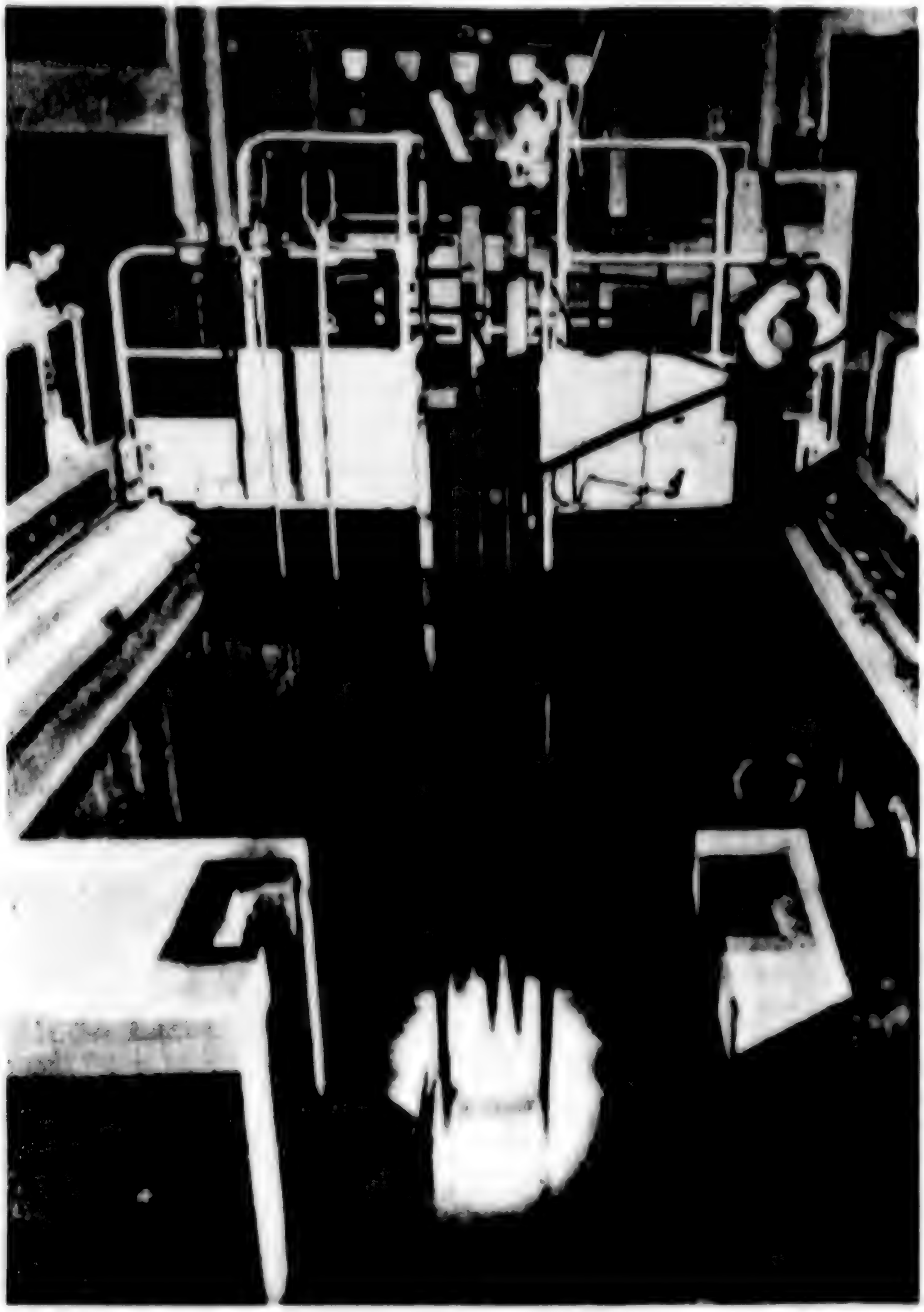
Despite its by now antiquated equipment, the IAN has proven that its effort to introduce alternatives for progress and energy has been constructive.

Our country has guaranteed a peaceful use of its nuclear programs by signing the Treaty of Tlatelolco, which bans the production of atomic weapons within the Latin American area. Thus, the impetus which nuclear development can receive in Colombia must come from the establishment of a plan for the utilization of nuclear electricity. Hence the importance of renovating and modernizing the equipment.

The only thing that has proven possible is to intensify the work aimed at finding the raw material for this type of energy: uranium.

These tasks, and those described previously, have been performed with difficulties associated with the shortage of skilled personnel and, furthermore, of educational centers for studies in the field of nuclear sciences.

It is possible that, in the future, Colombia may imitate the example of other more developed countries, and build several research centers in order to expand its field of activity, and continue to study new opportunities that would allow for a more efficient planning of the development, conservation and production of our resources.



"Swimming pool" type research reactor. The brightness given off by the reactor core at the bottom of the pool is called "Cherenkov radiation," and occurs when the particles charged with electricity pass through a transparent medium at speeds exceeding that of light.

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CSO: 5100/2244

# PROSPECTS FOR URANIUM EXPLOITATION ASSESSED

Bogota EL SIGLO in Spanish 14 Apr 81 p 3

[Article by Olga Cristina Turriago M.: "Colombia May Have 40,000 Tons of Uranium"]

> [Text] Over the years, uranium has been acquiring importance and value on the international market, primarily because an outstanding alternative to the oil crisis is involved.
>
> Many countries set to work and undertook extensive programs of exploration and exploitation of the new fuel, developing, at the same time, innovative designs and applications of nuclear reactors.
>
> Thus, the European countries, the United States and the Soviet Union set themselves up as powerful if not producers at least processors of uranium and they developed technologies that the Third World countries are now beginning to acquire.
>
> Although Colombia does not have either the required technology or equipment, it has undertaken a program of nuclear natural resources exploration that will begin to bear fruit around 1990, when the exploitation stage begins.

During the 16 years in which the reactor in the Nuclear Affairs Institute has been working, the amount of uranium consumed has been only 9 grams.

Like the Colombian reactor, most nuclear reactors use uranium as fuel, although it is possible also to burn thorium, another relatively abundant natural element.

According to scientists' calculations, four parts of every million parts of the earth's crust are uranium. It is present even in the oceans in low concentrations.

Exploitation of this radioactive mineral, whose price on the international market has been set at $45 a pound, is very costly and, because of this, deposits are located by means of the use of special radioactivity detectors.

Economically exploitable uranium deposits occur in sandstones, veins and conglomerates, which are the three main types of deposits.

At first, exploration was performed with the familiar Geiger counter, but now much more sophisticated equipment is being used making it possible to achieve the discovery of deposits from the air for the purpose of covering more area. Once the deposit has been detected, conventional exploration proceeds, in order to determine exactly the place where it is.

In its natural state, uranium has no harmful effects on the inhabitants of the surroundings, but when it begins to be mined and the deposits themselves are reached radioactivity presents some dangers. For that reason safety and protection measures are taken.

## World Production

At present, the total production of uranium is 40,000 metric tons a year. This means a large energy content.

Burning one single gram of uranium is equal to the same heat that 2,900 grams of coal or 13.5 barrels of oil can generate. It goes without saying, then, that the world production of the element is rather high.

Differently from what is true of oil, the industrialized countries, including the United States, Australia, South Africa, Canada and France, are the ones that have uranium.

In view of the dangerous nature of the mineral and its possible use for making nuclear weapons, the international uranium market is controlled by means of agreements and its sale is allowed only to those countries that prove that it will be used peacefully. This was one of the reasons why the Uranium Institute was established in London, assembling most of the producers and consumers of this fuel.

## Uranium in Colombia

Only after the establishment of the Nuclear Affairs Institute, in 1959, did the government begin to take an interest in a search for possible uranium deposits within the territory of Colombia.

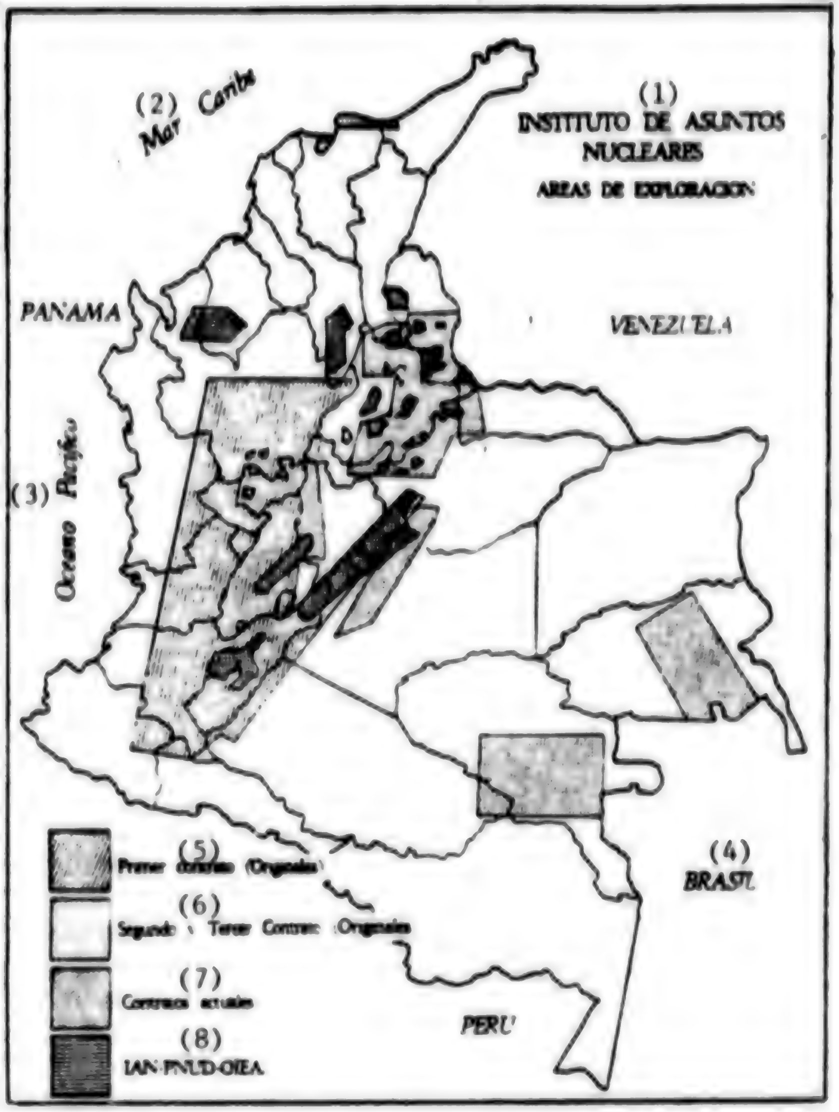
Then collaboration and assistance were received from international agencies like the United Nations and the International Atomic Energy Agency.

Study made it possible to determine good prospects and, owing to this and to the first effects of the increases in the price of oil, several countries decided to make contact with the IAN [Nuclear Affairs Institute] and the national government to develop contracts for exploring those resources in view of the alternative offered by the mineral for generating energy.

Colombia, on its part, was aware that professionals, technology and budgets were needed to make the program move forward.

At present, only foreign companies in association with the Colombian Government can proceed with exploration and exploitation, although exploitation has not begun, in view of the commitment that the country has to watch over proper use of the radioactive substance, which can be controlled only with the state's participation in the production stages.

Likewise, the government's participation in the exploitation contracts is owing to the advisability of having Colombian experts and scientists take part in it for the purpose of acquiring new techniques and of training for the future the personnel who will probably be responsible, later, for handling uranium exploitation on their own.



At present, the Nuclear Affairs Institute is carrying out intensive programs in three main areas: Cordoba; San Lucas, Bolivar, and Zapatoca, Santander. In these areas, in addition to ones explored by foreign companies, various kinds of tests have been made and modern methods, provided by international agencies, are being applied. Key: 1. Nuclear Affairs Institute, Exploration Areas; 2. Caribbean Sea; 3. Pacific Ocean; 4. Brazil; 5. first contract (original); 6. second and third contracts (original); 7. present contracts; 8. IAN-UNDP [UN Development Program]-IAEA [International Atomic Energy Agency].

## The Contracts

The first association contract, similar to existing contracts for oil and coal, was executed, in 1976, between the Nuclear Affairs Institute and the French company TOTAL, now MINATOME.

As a result of this first association, it was discovered that the sites whose uranium potential is most noteworthy are located north of Caldas, south of Huila, east of Cundimarca and west of Norte de Santander.

A second contract was signed with Spain, with the ENUSA [National Uranium Enterprise Incorporated] company. By means of its development, new zones with possible mineral deposits located in Cundinamarca, Boyaca and Norte de Santander were determined.

Work started in the commissioner territories of Guainia and Vaupes with the same Spanish company.

In the time between commencement of the work of exploration and the present, the areas with economically exploitable uranium resources have not been determined concretely, but these exploratory activities will be completed only in 1986. This leaves a considerable margin for determining the extent of profitable deposits.

If deposits are not found, the foreign companies will withdraw from the country without the incurrence of any obligation by the country.

Nevertheless, if the opposite happens, exploitation would be undertaken with the cooperation of the foreign companies until 1990 and with direct participation by COLURANIO [expansion unknown; probably Colombian Uranium Company], the company established for that purpose which should contribute approximately 50 percent of the investment.

It should be noted that IAN is conducting on its own account and risk explorations in areas already detected in 1974, for example in southern Cordoba and in San Lucas, Bolivar, where zones of interest are being evaluated preliminarily, and in Zapatoca, Santander, where aerial prospecting work is being performed to detect radioactivity. This last-mentioned region is regarded as the IAN pilot zone.

Everything indicates that the Llanos Orientales [Eastern Plains] and the central and eastern mountain ranges are the regions where the largest uranium deposits are found.

According to statements made by the director of IAN, Ernesto Villarreal Silva, it is estimated that the country has an exploitable potential of 40,000 metric tons of uranium, a very significant figure in South American countries, although Argentina and Brazil are higher than Colombia. Therefore, Colombia would be in third place in production.

Ernesto Villarreal Silva, director of the Nuclear Affairs Institute.

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CSO: 5100/2238

## URANIUM PROSPECTING CONTRACT SIGNED WITH FRANCE

Montevideo EL DIA in Spanish 27 Feb 81 p 5

[Text] Yesterday afternoon a contract was signed with the French Bureau of Geologic and Mining Research [Bureau de Recherches Geologiques et Minieres--BRGM] for uranium prospecting in the country, as part of the framework of the National Mining Inventory, now being formed. The above-mentioned contract was signed by the director of the National Geologic Institute, Col Walter Perez, and by Eng Albert Hankard, representing the BRGM, in the presence of the minister of industry and energy, Eng Francisco Tourreilles; the secretary of SEPLACODI [Information, Coordination and Planning Secretariat], Air Force Brig Gen Jose D. Cardozo; the French ambassador, Andre Le Guen, and before other civilian and military leaders.

The agreement marks the completion of a first 3-month-long phase or preliminary stage, which will be followed by another, operational in nature, which will extend over a 2-year period.

The schedule established will be adapted to the following steps: a) the training of a Uruguayan technician in France, in the methods and techniques used by the BRGM in uranium study; b) the undertaking of a complete study in Uruguay for the purpose of selecting priority zones, and for identifying those zones which will be prospected; and c) the operational stage.

The operational phase will include the following studies and services: 1) radiometric inspection carried out over 10,000 sq km; 2) systematic geologic and radiometric soil survey; 3) chemical analysis in France of the uranium, using 10,000 samples taken from the general mining inventory table; and 4) light borings which will be used for geophysical measurements (radioactivity, resistivity). The geophysical studies will specify the depth of the crystaline base beneath the sedimentary permian soil, and the geologic survey studies will define the detailed lithologic succession in the zone. At the same time, the radiologic surveys will put the various anomalies in their geologic context.

The results thus obtained will be the subject of a final report, which will be sent out 3 months after completion of the work.

The contract goes into effect 3 months after the signing, but the studies will begin in 30 days.

Almost 7 Million Francs

The previously mentioned studies will cost almost 7 million French francs about (about $1.5 million), 20 percent of which will be controlled by the 1981 Investment Plan; the remaining 80 percent will be financed by the French Societe Generale, with whom the corresponding loan will be finalized.

9730
CSO: 5100/2213

## BRIEFS

NUCLEAR POSSIBILITY--Commenting on Nigeria's commitment to develop nuclear capability, Dr Chuba Okadigbo, Special Adviser to the President on Political Affairs, said that what was needed was proof that the racist South Africa has acquired nuclear weapons with a clear intention of using them to intimidate the African continent and, in the process, stalling the progress of liberation struggles in Namibia and South Africa itself. He refused to share in the rumours that South Africa has already acquired a 155mm shell with a nuclear warhead through the help of some American, British, French, Belgian and Israeli corporations. He said that whenever the necessary proof is manifest, Nigeria would acquire and target nuclear response capability on the racist South Africa. While admitting that it takes several years to develop nuclear capability, Dr Okadigbo revealed that there are Nigerians already training at institutes of nuclear research throughout the world. With an aura of confidence, he said Nigeria has the potential to surprise the world in a few years time with a show of military force that would be unimaginable for a Third World country. He said Nigeria would be prepared to spend any percentage of her revenues to guarantee freedom and stability in the African continent. Dr Okadigbo said that no price would be too great to pay. On the whole, he said Nigeria is committed to finding non-violent solutions to often violent disagreements in the continent. Nigeria's efforts to find peaceful solutions to the problems in Namibia and South Africa would vindicate her as a peace-loving country, but he warned that Nigeria could be disposed otherwise if her position is misinterpreted as weakness. [Excerpt] [London WEST AFRICA in English 13 Apr 81 pp 792-793, 795]

CSO: 5100/4935

## SOUTH AFRICA

### NUCLEAR DEVELOPMENT PROGRAM DISCLOSED

LD041706 Johannesburg International Service in English 1500 GMT 14 May 81

[Unattributed commentary]

[Text] Last week it was announced that South Africa could produce enough enriched uranium for its research reactor near Pretoria. Now it has been officially stated that it has the capacity to produce enough of the far-greater quantities of the fuel needed to operate the country's first nuclear power station being built near Cape Town.

It is a sequel to the breakdown of an arrangement made between the South Africa and American Governments in 1974. The United States then contracted to sell South Africa the 12 kg of enriched uranium required by the research reactor and some 50 tons a year that would be required by the power station. However, in 1979 the Carter administration decided not to supply until South Africa had signed the nuclear nonproliferation treaty. This the South African Government is perfectly prepared to do in principle provided there is no disclosure of its enrichment process. It is a secret which since experiments began 20 years ago it has been determined to guard. When later the Uranium Enrichment Corporation built its production plant, it designed even its own cooling machine to ensure that no clues would be given, and despite many counts of organized spy campaigns to crack the technique, the secret has been kept. That accounts for the deadlock until now with America. Pretoria insists on guarantees against disclosure. Washington has insisted in the past on knowing more about the South African plant before guarantees. So far tentatives can be defined. [sentence as heard]

It is a classic catch-22 situation. Meantime the program of the research reactor has had to be curtailed and one of its main functions is to produce isotopes for medical application while the nuclear power station, having cost 2,000 million rand, is due to come on stream by the beginning of 1983.

There are these urgent reasons why South Africa itself should manufacture in sufficient quantity the enriched uranium it needs. And in this field of high and critical technology the lesson of it all again is the counterproductivity of forcing a determined nation to depend on its own resources.

CSO: 5100/2247

## PRODUCTION OF ENRICHED URANIUM SET FOR MEDICAL USE

Taipei THE CHINA POST in English 30 Apr 81 p 2

[Text] Pretoria, South Africa, April 29 (AP)--South Africa, unable to import enriched uranium from the United States, will produce its own supply for medical purposes and research projects at its Pelindaba plant, the government announced Monday night.

"It gives me great pleasure to announce that the Atomic Energy Board's research reactor, Safari-1, will in future be operated on locally produced fuel elements," Minister for Mineral and Energy Affairs F. W. De Klerk said in a statement released here.

"For international political reasons, it was not possible for South Africa to obtain nuclear fuel for Safari-1 since 1976. As a result of this and also because the country could not afford curtailment of the AEB's research program, and in particular the production of radio isotopes for medical application, which is almost entirely dependent on the operation of Safari-1, it was decided that a serious attempt should be made to supply the fuel from local sources," he said.

The minister said a uranium enrichment of 45 percent with respect to the 235 isotope is the minimum that could be utilized in Safari-1, located at the Palindaba plant about 30 miles (40 kilometers) north-west of Johannesburg.

CSO: 5100/4907

## BRIEFS

PRODUCES OWN NUCLEAR FUEL--Pretoria, 29 Apr--South Africa is now producing its own nuclear fuel, enriched uranium, which will in future be used to operate its atomic research reactor Safari One, Minister for Mineral and Atomic Affairs Frederick de Clerk announced today. He said the fuel would enable the production of radio isotopes for medical use and would be subject to international inspection and safeguards by the International Atomic Energy Agency (IAEA). South Africa had gone ahead with local production because it had not been able, for international political reasons, to obtain nuclear fuel for the reactor since 1976, the Minister said in a statement. The production of radio isotopes for medical use was almost entirely dependent on the Safari One reactor, he said. South Africa has always denied reports that it conducted a nuclear test in September 1979. De Clerk said South Africa's Uranium Enrichment Corporation had recently succeeded in producing a limited quantity of 45-percent enriched uranium, which has been processed into fuel elements by the Atomic Energy Board.--NAB/REUTER--[Text] [Rangoon THE WORKING PEOPLE'S DAILY in English 1 May 81 p 2]

CSO: 5100/4908

# TWO URANIUM PROSPECTING AGREEMENTS SIGNED

Lusaka TIMES OF ZAMBIA in English 30 Apr 81 p 5

[Text]

**SAARBERG Interplan of West Germany will spend about K5 million in prospecting for uranium in the country, Mines Minister Mr Mufaya Mumbuna announced in Lusaka last night.**

Speaking at the signing ceremony of the second uranium agreement between the Prescribed Mineral and Materials Commission and Interplan, Mr Mumbuna said the company had spent about K2.5 million on operations in the last two years.

Mr Mumbuna, who is commission vice-chairman, signed on its behalf, while Interplan vice president Mr Herbert Muller initialled for his company.

This is the second agreement to be signed in two days. The first was between the commission and Agip of Italy on Tuesday and Cogema of France which joined hands in their uranium mining operations.

The minister said the agreement provided Interplan with the opportunity to prospect, explore and mine uranium in parts of North-Western, Central and Copperbelt provinces.

He said the commission had tried to achieve all-round development of uranium in Zambia.

The programme would include a detailed airborne geophysical survey and a ground prospecting exercise which would take the company two to three years before they could advise on the potential of the deposits, he said.

Mr Mumbuna noted that by bringing in foreign investment and new techniques "we are opening avenues of employment for our university graduates".

He hopes Interplan's operations would lead to successful demarcation and exploration of uranium in the country.

Mr Muller pledged that his company would develop its Zambia branch into an exploration centre for Central and Southern Africa with headquarters in Lusaka.

This, he said, would be a challenge for the build-up of geological information,

CSO: 5100/4936

## MINES MINISTER COMMENTS ON URANIUM MINING PROSPECTS

Lusaka TIMES OF ZAMBIA in English 29 Apr 81 p 1

[Text] Uranium mining in the country may start by 1985, Mines Minister Mr Mufaya Mumbuna announced in Lusaka last night.

Data collected in the past two years "strongly" indicated that a number of small ore bodies may be outlined soon if the price of uranium maintained a reasonable level, he said.

Mr Mumbuna said this at the signing of the joint second uranium agreement with Agip vice-president Mr Manuel Dagnolo and Cogema regional manager for Africa Mr Andre Coste.

Mr Mumbuna said Agip's application to prospect for minerals in the Western Province had been approved by the Prescribed Minerals and Materials Commission.

The commission had allowed Agip to join Cogema in their work. Mr Mumbuna said Zambia had clinched better terms in the agreement.

"The information gathered suggests that a number of ore bodies of small dimension may be outlined soon, and if the price of uranium maintains a reasonable level there is every possibility that mining could begin by 1985-86.

"The introduction of Cogema on the scene should hasten that important day when Zambia shall export her uranium," he said.

Mr Mumbuna who is commission vice-chairman said in undertaking the agreement, the commission had laid the foundation for spreading development to new areas of the country.

"These developments augur well for the future of Zambia and it is up to us to make full use of the opportunities that are being presented," he added.

Mr Dagnolo pledged that Agip and Cogema would work "tirelessly" to develop uranium mining in the country and hoped Zambia would have a new mining industry soon.

The accord enlarged areas of activity and proved that "we are confident in Zambia's uranium potential."

"Agip Spa and Cogema are joining hands to make the greatest possible effort to define and develop all uranium resources in the assigned areas," he added.

Mr Coste said Agip's offer for joint work with Cogema gave his company the chance not only to learn that Zambia had a good investment climate, but to participate in a research project on which some "appreciable" work had been done.

"Cogema expresses the hope that this association between two large European companies will prove mutually beneficial for each of the parties and consequently for Zambia," he said.

CSO: 5100/4937

## SWISS FINANCIAL SUPPORT FOR NEW FRENCH REPROCESSING PLANT

Paris LE FIGARO in French 9 Apr 81 p 14

[Article by Laurent Mossu: "French-Swiss Agreement on Reprocessing"]

[Text] Swiss electrical companies are going to participate in financing a new uranium reprocessing plant at La Hague, in Normandy. Their financial participation will be in the order of 500 million Swiss francs (approximately 1.25 billion French francs). This will amount to about 12 percent, since the overall project estimate is about 10 billion brancs. This new facility is scheduled to become operational in 1987. It will be entirely dedicated to reprocessing spent nuclear fuel of foreign origin, particularly European and Japanese. At the same time, France is planning to open other installations dedicated exclusively to serving French needs.

This information was made public by Mr Claude Aycoberry, Director of the reprocessign branch of COGEMA [Nuclear Materials General Company], at a conference in Bern.

The Swiss investment coresponds to a real need since no reprocessing plant is planned to be built in Switzerland. The country is too small to justify such an installation, but it is obvious that it needs to reprocess its nuclear fuel and it looks to France in particular for assistance. The financial participation formula presents the added advantage that it will go to pay a part of the depreciation costs usually charged customers of COGEMA.

### Storing Problems

The direct infusion of capital eventually allows a foreign country to reduce operating costs signficantly. In evaluating reprocessing charges, depreciation charges are currently estimated at two-thirds of the total amount.

During these French-Swiss discussions, the return to Switzerland of nuclear waste by 1990 was considered and is the object of an agreement between the two countries. At that time, France will no longer store waste resulting from reprocessing at La Hague (on its territory). This is a critical problem confronting Switzerland, which has to find high-security locations to store radioactive waste materials. Swiss authorities have explored the possibility of a European solution enabling all European countries to keep their radioactive wastes in the same place. Such an international solution has not been completely ruled out, but the storing site question raises delicate problems since nobody wants to be everybody else's garbage can.

Switzerland is currently operating four nuclear plants which produce about 29.5 percent of the national consumption of electricity.

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CSO: 5100/2239

## SUPER-PHENIX BREEDER REACTOR SAFETY, PROFITABILITY

Paris LE MONDE in French 15 Apr 81 p 13

[Article by M. A. reviewing book by GSIEN (Groupement de Scientifiques pour l'information sur l'energie nucleaire): "Plutonium sur Rhone."]

[Text] The super-Phenix construction site located at Creys-Malville, about 50 kilometers from Lyons, has begun to resemble a nuclear site in the last few months. Our correspondent in Grenoble, Claude Francillon, indicates that the structural cosntruction is practically complete and that installation of the turbo-alternators began several weeks ago. The steam generators will be delivered at the end of 1981.

Operation of the plant should begin in early 1984, or about six months later than initially planned. For the management of NERSA, the company building Super-Phenix, the absence of serious problems "shows that France has mastered the breeders technique."

This is not the opinion expressed in "PLUTONIUM SUR RHONE"*, a book just published by the Grenoble members of the Groupement de Scientifiques pour l'Information sur l'Energie Nucleaire (GSIEN) (Group of Scientists for Information on Nuclear Energy). The book is based in part on the preliminary Super-Phenix report written by NERSA and hidden away 3 years ago in the Lyons offices of the company by an ecology group. One of the main difficulties encountered by the authors was in fact to obtain sufficiently complete and unbiased information. Although the safety aspect of the book is the most important, it is not the most convincing. It calls upon too many quotations taken out of context and elevated to the level of major contradictions. One can, however, find information that those responsible for the breeder program do not make generally available: for instance that whereas Super-Phenix is designed to withstand an accident producing an energy of 800 megajoules, the American Clinch River project, although three times smaller, is designed to withstand 1,200 megajoules.

Uncertainties about the competitiveness of the breeder program are more interesting. According to the GSIEN, the construction cost of a breeder will remain at least 30 percent above that of a PWR reactor such as EDF is currently building. This additional cost could only be compensated by savings in fuel--breeders use plutonium whereas PWR's use enriched uranium--if the cost of uranium would at least triple. This assumption is not realistic, because among other things, a strong price increase would be self-limiting by allowing the use of deposits whose mining is not profitable today.

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*Plutonium sur Rhone Super-Phenix, insecurite et incertitudes. Editions Syros, 240 pp, about 70 francs.

This analysis--very briefly summarized here--can be contested, but it would be necessary to provide another and let it be the object of debate.* The GSIEN was created initially because researchers had the feeling that official speeches called upon a "scientific" basis whereas the scientific community in general did not have any particular competency on the subject matter. It then attempted to play the role of re-evaluator, but the interest of this role has been totally ignored by the authorities, with the notable exception of the Council for Information on electro-nuclear energy. And when Parliament attempts to create a modest Technological Choices Evaluation Committee, the Ministry of Industry objects based on the startling argument that Parliament cannot "delegate to technocrats its prerogatives" in controlling the government.

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* Some elements of this debate, along with a totally different viewpoint, may be found in "Pourquoi l'Energie Nucleaire?". C.E.A. collection, Editions Eyrolles. 330 pp.

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CSO: 5100/2240

## COMMITTEE ASSESSES ACCIDENT RISKS, PREVENTION POLICIES

Paris LE MONDE in French 17 Apr 81 p 34

[Article by Bruno Dethomas: "Parliamentary Report Considers Means Inadequate"]

[Text] After the accident at the nuclear power plant at Three Mile Island, in Pennsylvania, on 28 March 1979, The Production and Exchange Commission of the National Assembly had created a working group to "Investigate the methods used to protect the population in case of an accident resulting in radioactive emissions".

Four deputies, and then nine--two from each political group and one unattached--have studied this question for almost two years under the direction of Mr Xavier Hamelin, deputy from the Rhone department (RPR).

An initial report, published in the summer of 1979, had mainly proposed speeding up the specific intervention plans (PPI) derived from the ORSEC [Disaster Relief Organization] plans to be used in case of nuclear accident or incident. It would indeed seem logical for "no nuclear installation to be put into operation without those responsible for the plant management, local elected officials, and the population being fully aware of these plans".

The second report, published on 16 April, is not revolutionary either. But in its desire to prevent any nuclear accident and provide better information in order to make this industrial activity commonplace, the parliamentary working group has identified a number of inadequacies in the protection of individuals. The best means of prevention involve a very strict control of all materials used in plant construction, and high-quality training of the workers.

In actuality, whereas more than five nuclear powr plants are placed on line each year, the technical inspection of the basic nuclear installations is provided by a group of only about 50 inspectors reporting to the ministries of the Environment and Industry, the majority of whom perform this function on a part-time basis.

The same is true of personnel training where equipment--simulators--is lacking. The working group has therefore observed that "There is in fact at the present time, a lack of experienced technicians trained to run power plants and competent to handle any situation". The deputies then recommend "an increase in the frequency of inspections" and that "all members of the teams employed in running power plants should take a complete simulator course".

Civil Protection

After the men, the means. The working group believes it is absolutely necessary to increase "the funds which are currently lacking at all levels, and especially in the area of civil protection". A serious incident would require that "the civil protection services have available suitable equipment for individual protection, radioactivity measurements, and sign posting, and have had suitable training in the use of this equipment in field conditions resembling actual conditions as closely as possible". In fact, the deputies point out that "It is not certain that all units have adequate equipment today".

Finally, information must be improved. Inhabitants of the areas concerned who do not receive PPI information "should be able to consult them in their city halls if they so desire". Furthermore, the information booklets describing the intervention plans are sometimes totally inadequate (simple brochures).

The information available to mayors, the press, and various associations is sometimes far from complete. The working group maintains that "all too often, plant management is late in notifying the authorities about incidents" and adds that "plant management as well as local authorities should be imbued with the idea that everything mysterious is worrisome".

The deputies propose the creation, at each plant site, of an information commission on the plant's operation which would include the plant's general manager, local elected officials and the mayors of neighboring townships, ecology groups, and unions. The commission would meet in every instance of incident. This proposal is far from generating enthusiasm at the EDF [French Electric Power Company] and with supporters of nuclear power.

In spite of these numerous points of detail--but in case of incident or accident, details are often important--the working group believes that "the probability of an accident with grave consequencies for the population appears extremely slight". But it worries about other potential industrial risks.

The working group believes it should "point out that in a country where the citizens' safety requirements are constantly increasing and where the dangers of an industrial catastrophe with human origin, particularly in urban areas, have significantly increased, the real problem is that of prevention against these dangers, and adaptation of the rescue services to the extensive nature of these new risks".

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CSO: 5100/2239

## NEW PLANT TO PROCESS ENRICHMENT PLANT WASTES

Paris CEA INTER-INFO in French 1 Feb 81 p 2

[Article: "COGEMA 'Project W'"]

[Text] Defluoridation plants for the hexafluoridation of weakened uranium.

The General Nuclear Materials Company [la Compagnie Generale des Matieres Nucleaires] plans to construct on the site of the Pierrelatte premises a plant for the processing of waste material from plants that enrich uranium through gaseous diffusion.

Let us recall that these wastes are the result of the hexafluoridation of uranium weakened to 0.2 percent in fissile isotopes, uranium 235.

The reason for this decision is a desire to stockpile these wastes on a long-term basis in a more suitable manner.

The selected method causes the transformation, through chemical reaction, of the hexafluoridation of weakened uranium into a very stable and only slightly reactive oxide, the uranium sesquioxide of chemical formula $U_3O_8$.

The defluoridation of the hexafluoridation of uranium is realized in two stages:

- A first reaction (hydrolysis), effected at 300° C, transforms the hexafluoridation into the oxifluoridation of uranium.

- A second reaction (pyrohydrolysis), realized at 750° C in an electrically heated rotating oven, transforms the oxifluoridation of uranium into the desired oxide.

The hydrofluoric acid freed by these two reactions is condensed at a low temperature in the form of a concentrated solution.

The oxide that is formed would be conditioned in waterproof metal containers, and they, too, would be stored for a long period in sheds, thus ensuring a dual barrier for the confinement of the product away from outside contact.

Another advantage of the process is that a by-product that would be highly commercial is formed during the processing: a concentrated solution of hydrofluoric acid in water.

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CSO: 5100/2246

# TOWN APPROVES PLAN TO MINE URANIUM

Stockholm DAGENS NYHETER in Swedish 28 Apr 81 p 10

[Article by Kaa Eneberg, of the Norrland editorial staff of DAGENS NYHETER: "Pleutajokk Approved by Smallest Margin"]

> [Text] By the smallest possible margin, 16-15, the Arjeplog town council on Monday evening approved as expected the application of LKAB [Luossavaara-Kiirunavaara Mining Company] for uranium mining at Pleutajokk.

All of the 13 social democrats, the 2 liberals, and the sole representative of the Labor Party Communists voted in favor of uranium mining. The representatives of the Center Party, Left Party Communists, Christian Democratic Union, and Arjeplog's Free Democratic Party were opposed.

The uranium debate in Arjeplog's town council, which was broadcast live on the radio in Norrbotten, began promptly at 1900. The debate ended 1.5 hours later, and the historic decision was reached by 2035.

The vote before the town council was on localizing the project according to paragraph 136A of the building code. If Arjeplog's politicians had vetoed uranium mining the entire project would have been stopped.

Monday's meeting of the town council was also the first in a long list of decisions which must be made before uranium mining can begin in 3 years at the earliest, or the end of 1984.

The government will make the final decision on whether the uranium mine at Pleutajokk will be opened.

## Fixed Positions

Jack Backlund, social democrat and town councilman, advised members of the council to be brief, as he considered that positions were already so fixed that they would not be able to convert each other. On this point his prayers were answered.

## Thorbjorn Falldin: No Go-Ahead for Uranium Mining

"An affirmative vote from Arjeplog's council for uranium mining at Pleutajokk is by no means a definite go-ahead. Later there will be tests of the effects on the environment, which international experts say are much more extensive than previously thought."

So said Prime Minister Thorbjorn Falldin from the speakers platform in the Riksdag on Monday, in an attempt to calm the concern of Eivor Marklund of the Left Party Communists over uranium mining in her home district. Falldin's own party wants to prohibit uranium mining in Sweden.

Falldin agreed with Eivor Marklund that the order of things--first tests under the building code and later tests for the environment--is not the best. He referred also to his own party's efforts to get a prohibition against uranium mining through the Riksdag. A Center Party motion on this question is being debated in the present Riksdag.

### Disappointment

"But as prime minister it is my task to carry out the applicable law," he said.

Eivor Marklund expressed disappointment that Falldin, with "his background" could not express himself more strongly on this question. She also pointed out that LKAB's reports on Pleutajokk, which are very defective, are going to be the basis for all decisions.

"Throughout the entire affair LKAB has had a clear advantage," said Marklund. She said that it is disturbing that LKAB's reports, which are questioned by independent experts, are considered to be "objective facts," while information from the environmental organizations is regarded as nonsense and empty verbiage.

Falldin agreed with Marklund that environmental problems with the mining are great.

### Radon Threat

The problems are not only that the workplace will be threatened by radon and radioactive emissions, but also how to deal with the refuse from the mining. Marklund pointed out that LKAB claimed that these questions would be solved, but did not say how. Solutions can be expensive, said Marklund, and this further weakens profits.

Falldin said that after the environmental tests by the environmental protection authorities, it is LKAB's responsibility to look after the economic requirements for providing Swedish energy firms with uranium at acceptable prices.

Swedish uranium should not be used for anything but domestic uses, according to Falldin. He said that in consideration of nuclear weapons development, there is a great responsibility if uranium is mined for export.

## Struggles Remain

Although local politicians at Arjeplog have now given the go-ahead to the Pleutajokk mine, it does not mean that all is clear for LKAB to begin mining uranium. There are still many hard encounters ahead with different authorities and within the government.

What the Arjeplog town council did on Monday evening was to take a position on the project outside the veto paragraph of the building code. They decided not to employ the right of veto. If they had used it, that would have been a death blow to the project.

Now there remain tests at various stages in accordance with environmental protection laws, atomic energy laws, radiation safety laws, and mineral laws.

The most important authorities in these tests will be the National Institute for Radiation Protection (SSI) and the National Franchise Board for Environmental Protection. SSI has already notified LKAB that the requirements for safe mining which will be demanded are going to be expensive to carry out.

Next the Riksdag on 26 May will take a position on a motion for a law against uranium mining. It was introduced by the Left Party Communists and two Center Party Riksdag members. The social democrats and liberals have not announced a position on uranium mining since the referendum last year, but it is probable that the law will be rejected by the Riksdag. The conservatives are against such a law.

On 3 June the National Franchise Board for Environmental Protection will begin discussions at Arjeplog. They will conduct a thorough survey of the environmental questions and thereafter report to the government, which expects to reach a mining decision during the autumn. Then the board will begin its own tests of the project. It will be finished some time next year.

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CSO: 5100/2245

## BRIEFS

NEW URANIUM FIND--A new uranium find has been discovered by SGU [Geological Survey of Sweden]. The discovery was made at Heika, 50 km north of Pleutajokk, and consists of a large number of rocks with high uranium content. The discovery is considered better than the one at Pleutajokk where LKAB will open its uranium mine. SGU has made test borings at the new area and has confirmed that a rich uranium deposit exists there. [Text] [Stockholm DAGENS NYHETER in Swedish 25 Apr 81 p 1] 9287

NUCLEAR WASTE SITE TESTING--Vanga Mountain by Lake Immeln north of Kristianstad is of current interest as a site for final deposit of nuclear fuel waste. SKBF [Swedish Nuclear Fuel Supply Company] has contacted the Swedish Forest Service, which owns Vanga Mountain, for permission to make test borings, according to Kristianstad Radio. "We believe that Vanga Mountain is suitable for the purpose," said Lars Nilsson of SKBF. "The bedrock is firm and thick, without fissures, and the underground water movement is low." In early May SKBF will have the answer from the Forest Service as to the possibility of test boring. [Text] [Stockholm DAGENS NYHETER in Swedish 29 Apr 81 p 41] 9287

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